Strategic Initiative 1 – Accelerate Silos 1&2

Subproject Description

Silos 1&2, two concrete silos located on the western periphery of the site, contain 8,890 cubic yards of low-level wastes that remained after extraction of uranium from pitch-blende ores received from the Belgian Congo. Over half of these radium-bearing residues, which date back to the 1950s, were originally generated at the Mallinckrodt Chemical Works in Saint Louis and then shipped to Fernald for storage. The remaining residues were generated at Fernald during the processing of these same ores. In 1964, an earthen berm was placed around Silos 1&2 to reinforce the structural integrity of each silo.

Based on the approved Record of Decision for Operable Unit 4, the cleanup remedy for Silos 1&2 requires removal of the wastes from the concrete silos followed by chemical stabilization and off-site disposal.

Execution Strategy

The execution strategy in the revised 2006 baseline for the remediation of the Silos 1&2 contents includes transferring the waste to tanks for staging, treating the waste by chemical stabilization, and shipping the stabilized material off site for disposal. The material in Silos 1&2 will be transferred to the new Transfer Tank Area for safe interim storage pending final treatment and disposal. The work also includes construction of a radon control system to mitigate radon emissions from the silos, the Transfer Tank Area, and the future Silos 1&2 full-scale remediation facility.

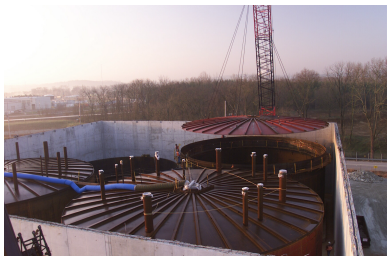
The treatment facility will consist of a slurry receipt system to receive the transferred material from the Transfer Tank Area, a chemical stabilization facility to treat Silos 1&2 material, and a system to containerize the treated material. Chemical stabilization is defined as a non-thermal treatment process that mixes the Silos 1&2 material with chemical additives to accomplish chemical and physical binding of the constituents of concern. These processes provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form. The treatment facility will also have an air emissions control system for control of radionuclide particulate emissions from the treatment process. Both the Transfer Tank Area and the treatment facility are connected to the radon control system for control of radon emissions from the remediation process.

The design was performed by Jacobs Engineering (a Fluor Fernald teaming partner) and utilizes "off-the-shelf" hydraulic retrieval systems and stabilization equipment to handle the waste. A parallel review cycle was provided for stakeholders to reduce the overall duration of the final design. In addition, early procurement of long-lead components allowed construction to begin on schedule. Jacobs Engineering has engaged key treatment component vendors in the design process, which ensured compatibility of key components with the balance of plant design. Early design packages were issued for procurement of non-treatment-related components (e.g., warehouses) concurrent with final design to accelerate the overall construction schedule. Fluor Fernald will provide construction management and direct the operations, packaging, and shipment activities.

New Strategies to Achieve 2006 Closure

In order to accelerate site closure from 2009 to 2006, the following initiatives were developed for the Silos 1&2 subproject:

- Dispose of the treated Silos 1&2 material at a permitted off-site commercial disposal facility and the Nevada Test Site to accelerate disposal and avoid unplanned shutdowns in shipping operations
- Utilize bulk transport by rail and direct truck shipments
- Accelerate the design, procurement, and construction of the treatment facility by earlier vendor involvement and early release of design packages for procurement of non-treatment-related facilities and components



In order to accelerate the off-site disposition of the Silos 1&2 waste, DOE is pursuing an Explanation of Significant Differences to the Operable Unit 4 Record of Decision to permit parallel disposal of Silos 1&2 materials as 11e.(2) waste at Envirocare in Utah in addition to the Nevada Test Site. This action reduces the risk of an unplanned shutdown of the silos shipping program and permits the bulk rail shipping and direct truck shipping of silos wastes. The addition of rail transport reduces cost and schedule risk associated with activities on the critical path. DOE is currently working with local stakeholders, Ohio EPA, and U.S. EPA to gain concurrence for this initiative.

The modification to the Record of Decision will be pursued in conjunction with an NRC license modification that permits disposal of Silos 1&2 wastes in Envirocare's 11e.(2) disposal cell. Envirocare is in the process of preparing a waste-specific license modification for submittal to the NRC, requesting approval to raise the facility's radium-226 waste acceptance criteria limit from 4,000 pCi/g to 100,000 pCi/g to accommodate Fernald's wastes. This approval is contingent upon Envirocare's ability to demonstrate the protectiveness of the cell design at the higher radium concentrations.

Treatment of Silos 1&2 material will result in the production of about 7,000 containers weighing 22,000 pounds each. Under the revised plan, three or four containers will be placed onto each flat rail car and two containers will be placed onto each truck. Rail and truck shipments will operate in parallel with approximately 90% of the containers being shipped by rail.

Contaminated soil underlying the Silos 1&2 treatment facility was removed prior to construction to streamline post-remediation certification of the area.

In addition to the remediation of Silos 1&2 contents, the subproject will consist of the safe shutdown and demolition of the concrete Silos 1&2 structures. The scope also includes facility shutdown of associated waste removal and treatment facilities prior to turnover of the treatment facilities to the Facility D&D subproject.

Current Subproject Status

Subproject Status:

- Overall subproject is 38% complete
- Design is 100% complete
- Accelerated Waste Retrieval Facility and Treatment Facility are being constructed
- Operations of the stabilization facility is scheduled for September 2004
- Waste disposal at Envirocare and Nevada Test Site is scheduled to start in October 2004
- Cost to Complete: $200 million
- Subproject will be complete in March 2006

The remedial design has been completed and the overall subproject is 38% complete. Construction is currently underway on the Transfer Tank Area with the four 750,000-gallon transfer tanks being complete and final piping and wiring currently underway. The Transfer Tank Area will be complete by December 2003. Construction is complete for the Radon Control System and it began continuous operations in June 2003. The waste treatment facilities and associated warehouses, rail spur, and loadout facilities are currently under construction and will be completed in early 2004. The subproject will be complete in March 2006.

Key Actions and Responsibilities

The following table lists the key actions needed to accelerate the Silos 1&2 subproject to meet 2006 site closure. Also included are the responsible organizations, the status of the key action, and the date that the key action is needed. The key actions for all eight strategic initiatives are compiled in Attachment 2.

Key Actions and Responsibilities for Silos 1&2

Action	Responsibility	Status	Date Needed
Reduce overall duration of final design through parallel review cycle for stakeholders	Fluor Fernald	Complete	—
Engage key treatment component vendors in Silos 1&2 design process	Fluor Fernald	Complete	—
Early procurement of long-lead components	Fluor Fernald	Complete	—
Issue early design packages to construction during Silos 1&2 process design for non-treatment-related components	Fluor Fernald	Complete	—
Modify the Record of Decision to permit disposal of Silos 1&2 materials as 11e.(2) waste at Envirocare in Utah	DOE-OH and Fluor Fernald	In progress	Fall 2003
Gain NRC approval of a license modification to permit disposal of Silos 1&2 waste in Envirocare's 11e.(2) disposal cell	DOE-HQ, DOE-OH, and Fluor Fernald	In progress	2/1/04